



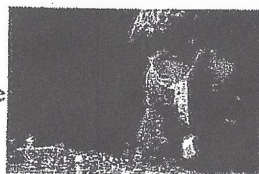
THE SPORTING SCENE

AUGUST 21, 2013

COMPLEXITY AND THE TEN-THOUSAND-HOUR RULE

BY MALCOLM GLADWELL

Forty years ago, in a paper in *American Scientist*, Herbert Simon and William Chase drew one of the most famous conclusions in the study of expertise:



There are no instant experts in chess—certainly no instant masters or grandmasters. There appears not to be on record any case (including Bobby Fischer) where a person reached grandmaster level with less than about a decade's intense preoccupation with the game. We would estimate, very roughly, that a master has spent perhaps 10,000 to 50,000 hours staring at chess positions...

In the years that followed, an entire field within psychology grew up devoted to elaborating on Simon and Chase's observation—and researchers, time and again, reached the same conclusion: it takes *a lot* of practice to be good at complex tasks. After Simon and Chase's paper, for example, the psychologist John Hayes looked at seventy-six famous classical composers and found that, in almost every case, those

composers did not create their greatest work until they had been composing for at least ten years. (The sole exceptions: Shostakovich and Paganini, who took nine years, and Erik Satie, who took eight.)

This is the scholarly tradition I was referring to in my book "Outliers," when I wrote about the "ten-thousand-hour rule." No one succeeds at a high level without innate talent, I wrote: "achievement is talent plus preparation." But the ten-thousand-hour research reminds us that "the closer psychologists look at the careers of the gifted, the smaller the role innate talent seems to play and the bigger the role preparation seems to play." In cognitively demanding fields, there are no naturals. Nobody walks into an operating room, straight out of a surgical rotation, and does world-class neurosurgery. And second—and more crucially for the theme of *Outliers*—the amount of practice necessary for exceptional performance is so extensive that people who end up on top need help. They invariably have access to lucky breaks or privileges or conditions that make all those years of practice possible. As examples, I focussed on the countless hours the Beatles spent playing strip clubs in Hamburg and the privileged, early access Bill Gates and Bill Joy got to computers in the nineteen-seventies. "He has talent by the truckload," I wrote of Joy. "But that's not the only consideration. It never is."

Recently, there has been some confusion about this argument. Some of the critiques are just bewildering. Here, for example, is a passage from an article in *Time* a few months ago, which makes me think that there is another Malcolm Gladwell out there, with far more eccentric views than mine, who put on a Halloween wig and somehow conned his way into the Time Life Building:

Based on research suggesting that practice is the essence of genius, best-selling author Malcolm Gladwell popularized the idea that 10,000 hours of appropriately guided practice was "the magic number of greatness," regardless of a person's natural aptitude. With enough practice, he claimed in his book *Outliers*, anyone could achieve a level of proficiency that would rival that of a professional. It was just a matter of putting in the time.

Regardless of a person's natural aptitude?

A more thoughtful response comes from David Epstein in his fascinating new book *The Sports Gene* (<http://www.newyorker.com/online/blogs/sportingscene/2013/07/gen-searching-for-the-perfect-athlete.html>). Epstein's key point is that the ten-thousand-hour idea must be understood as an *average*. For example, both he and I discuss the same study by the psychologist K. Anders Ericsson that looked at students studying violin at the elite Music Academy of West Berlin. I was interested in the general finding, which was that the best violinists, on average and over time, practiced much *more* than the good ones. In other words, within a group of talented people, what separated the best from the rest was how long and how intently they worked. Epstein points out, however, that there is a fair amount of variation behind that number—suggesting that some violinists may use their practice time so efficiently that they reach a high degree of excellence more quickly. It's an important point. There are seventy-three great composers who took at least ten years to flourish. But there is much to be learned as well from Shostakovich, Paganini, and Satie.

Epstein makes two other arguments that are worth mentioning. The first is about chess. He cites a study by Guillermo Campitelli and Fernand Gobet of a hundred and four competitive chess players. Epstein says that they found that the average time it took to reach "master" status was eleven thousand hours—but that one player

reached that level in just three thousand hours. This is variation on an extreme scale. Does that mean that in chess "naturals" really *do* exist? I'm not so sure. Epstein is talking about chess *masters*—the lowest of the four categories of recognized chess experts. (It's Division II chess.) Grandmasters—the highest level—are a different story. Robert Howard, of the University of New South Wales, recently published a paper in which he surveyed a group of eight grandmasters and found that the group hit their highest ranking after fourteen thousand hours of practice. Even among prodigies who reached grandmaster level before the age of sixteen, we see the same pattern. Almost all of that group reached grandmaster level at fourteen or fifteen, and most started playing when they were four or five. The famous Polgár sisters (two of whom reached grandmaster status) put in somewhere north of *fifty thousand hours* of practice to reach the top. Epstein, similarly, argues that studies show that it takes only four thousand hours to reach "international levels" in basketball. The study in question was of a sample of players from the Australian men's basketball team. I have nothing against either Australia or Australian basketball. But I'd be a bit more impressed if someone could find a starting point guard *in the N.B.A.* with fewer than ten years of basketball under his belt. Arguments about what it takes to be an elite performer are less persuasive if the performers being studied aren't actually elite.

I think that it is also a mistake to assume that the ten-thousand-hour idea applies to every domain. For instance, Epstein uses as his main counterexample the high jumper Donald Thomas, who reached world-class level after no more than a few months of the most rudimentary practice. He then quotes academic papers making similar observations about other sports—like one that showed that people could make the Australian winter Olympic team in skeleton after no more than a few hundred practice runs. Skeleton, in case you are curious, is a sport in which a person pushes a sled as fast as she can along a track, jumps on, and then steers the sled down a hill. Some of

the other domains that Epstein says do not fit the ten-thousand-hour model are darts, wrestling, and sprinting. "We've tested over ten thousand boys," Epstein quotes one South African researcher as saying, "and I've never seen a boy who was slow become fast."

As it happens, I have been a runner and a serious track-and-field fan my entire life, and I have never seen a boy who was slow become fast either. For that matter, I've never met someone who thinks a boy who was slow can become fast. Epstein has written a wonderful book. But I wonder if, in his zeal to stake out a provocative claim on this one matter, he has built himself a straw man. The point of Simon and Chase's paper years ago was that cognitively complex activities take many years to master because they require that a very long list of situations and possibilities and scenarios be experienced and processed. There's a reason the Beatles didn't give us "The White Album" when they were teen-agers. And if the surgeon who wants to fuse your spinal cord did some newfangled online accelerated residency, you should probably tell him no. It does not invalidate the ten-thousand-hour principle, however, to point out that in instances where there are not a long list of situations and scenarios and possibilities to master—like jumping really high, running as fast as you can in a straight line, or directing a sharp object at a large, round piece of cork—expertise can be attained a whole lot more quickly. What Simon and Chase wrote forty years ago remains true today. In cognitively demanding fields, there are no naturals.

Photograph by Kent Skibstad/AFP/Getty.



Malcolm Gladwell has been a staff writer for the *The New Yorker* since 1996.

Based on Mihaly Csikszentmihalyi's
Flow Theory

